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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|---------------------|------------------|
| 09/921,382 | 08/02/2001 | Jiaming Huang | TI-29593 | 6911 |
| 23494 | 7590 | 12/10/2003 | | |
| TEXAS INSTRUMENTS INCORPORATED P O BOX 655474, M/S 3999 DALLAS, TX 75265 | | | EXAMINER | |
| | | | VINH, LAN | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 1765 | |

DATE MAILED: 12/10/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | |
|------------------------------|--------------------------------------|-------------------------------------|
| Office Action Summary | Application No. 09/921,382 | Applicant(s) HUANG ET AL. |
| | Examiner Lan Vinh | Art Unit 1765 |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 03 October 2003.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-6, 12-14, 19 is/are pending in the application.
- 4a) Of the above claim(s) 1-6 is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 12-14 and 19 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) The proposed drawing correction filed on _____ is: a) approved b) disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) All b) Some * c) None of:
1. Certified copies of the priority documents have been received.
2. Certified copies of the priority documents have been received in Application No. _____.
3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) The translation of the foreign language provisional application has been received.
- 15) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in–
(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or
(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

2. Claims 12, 13, 14, 19 are rejected under 35 U.S.C. 102(e) as being anticipated by Winniczek et al (US 6,228,278).

Winniczek discloses a method for determining an etch endpoint in a plasma processing system, the plasma system having an RF power source connected to a plasma system/chamber by a network consisting of a capacitor and resistor/a matching network (fig. 4). This method comprises the steps/actions of:

using monitoring circuitry 402 to monitor/measure the voltage at node 250 (compensating voltage/voltage difference) across a resistor/an element in a network consisting of a capacitor and resistor/matching network (col 5, lines 64-65; col 6, lines 40-41 and fig. 4 shows that the resistor is located outside/external of the plasma system)

the compensation voltage changes as the etch progress (col 6, lines 15-17). Fig. 3 of Winniczek shows a change (an increase) of the compensation voltage prior to the end of the etch in region 304.

the end of the etch is evidenced by a steep upward slope/voltage change in the vicinity of region 304 (col 6, lines 23-25, fig. 3 of Winniczek shows the etch stop region 304 wherein a voltage change (curve 302) exceeds 1V between 100 sec and 125 sec, which reads on stopping etch when the voltage change exceed a predetermined amount within a predetermined time

The limitation of using a resistor as an element, as recited in claim 13, has been discussed above.

Regarding claim 14, fig. 3 of Winniczek shows a voltage change (curve 302) of more than 5% from 1V to 2 V, which reads on a claimed voltage change of not less than 5%. Winniczek also discloses that the compensating voltage curve 302 change as the etch progress to the end region within a time period of 100 sec to 125 sec (fig. 3), which reads on a voltage change of not less than 5% from a reference voltage within a predetermined time of not less than 3 seconds.

Regarding claim 19, fig. 4 of Winniczek shows a plasma system having an RF power source connected to a plasma system/chamber by a network consisting of a capacitor and resistor/a matching network.

3. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Bashir et al (US 5,856,239) discloses that etch endpoints is an etch parameters (col 2, lines 50-52)

Response to Arguments

4. Applicant's arguments filed 10/3/2003 have been fully considered but they are not persuasive.

Applicants argue that the Winniczek reference teaches detecting a change in the current supplied to the poles of the electrostatic chucks, the detection depends on the completion of the etching of the target. The examiner disagrees because beside the teaching of detecting a change in the current supplied to the poles of the electrostatic chucks, Winniczek also teaches the changes of the compensation voltage as the etch progress from a point 302 to the end of the etch at region 304, which reads on the feature of detecting a change of the voltage prior to the completion of the etching, as recited in claim 12.

Applicants further argue that it is clear that the Winniczek reference teaches a method that detects the current from a power supply to an electrostatic chuck and looks for a discernible change of current at the clearing of the target whereas claim 12 of the present invention detects a voltage change across an external element prior to the completion of the etching of the target layer. This argument is unpersuasive because as shown in fig. 3 of Winniczek, Winniczek discloses using monitoring circuitry 402 to monitor/measure a voltage at node 250 (compensating voltage/voltage difference) across a resistor/external element and measuring/detecting the compensation voltage

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changes as the etch progress to the end as seen in fig. 4. Thus, the examiner asserts that Winniczek discloses measuring/detecting a voltage change across an external element prior to the completion of the etching of the target layer.

5. THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lan Vinh whose telephone number is 703 305-6302. The examiner can normally be reached on M-F 8:30-5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on 703 305-2667. The fax phone numbers for the organization where this application or proceeding is assigned are 703 872-9310 for regular communications and 703 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703 308-0661.



LV
December 3, 2003